

## INCREASING THE PRODUCTIVITY BY USING WORK STUDY IN A MANUFACTURING INDUSTRY- LITERATURE REVIEW

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### ABSTRACT

*Productivity increase by means of a workstudy in a manufacturing industry is the area of interest in this project. The project was conducted life , wherein numerous types of tools and techniques were employed to improve the efficiency and productivity of the industry.*

*In essence, our project deals with the small-scale manufacturing industry. This concerned company in the project manufactures and supplies sheet metal components, including cyclones, electrical panel, stainless steel online humidification system and its components, and controlling panel. In addition, the company is a vendor of Nail Strip Jumbo, which is utilized in ginning machines.*

*This live project applied work study methods to improve the practices in the industry, in addition to ascertaining and rectifying problems associated with the production process. The employment of such techniques improved production by reducing production time and processes involved, as well as an increase in the production rate. This project highlights the advantages of adopting such an efficient process.*

**KEYWORDS:** *Production Time, Productivity, Work Study, Work Measurement & Fatigue*

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### INTRODUCTION

The concerned company in the project manufactures and supplies sheet metal components. In addition, the company is a vendor of Nail Strip Jumbo, which is utilized in ginning machines. An increase in demand must be complemented by the capability to increase productivity.

The production department was identified to have certain work processes that could be made reductant, as these steps consumed extra time and extra effort, in addition to increasing the cost of its product. Moreover, these processes resulted in workers' fatigue, which proved as a damper to the improvement of productivity.

One of the most powerful tools to eliminate unwanted processes and improve productivity is WORK STUDY. The study examined the problems associated with production from the point of a workstudy. Doing so would help to lower the production time and decrease unwanted fatigue.

### LITERATURE REVIEW

The tools and techniques employed in the steel foundry industry vary in the literature. In addition, literature provides little information regarding the implementation of end solutions in the industry. This study also provides details regarding the methods to implement those tools in research work, while providing particulars

about related research in literature.

Mayank Dev Singh conducts research “To Improve Productivity by Using Work Study & Design a Fixture in Small Scale Industry”. Furthermore, he uses the Pro-E model software for model testing and developing a new model.

Mihir B Patel and Prof. Dr. Hemant R. Thakkar has worked on “Reducing Manufacturing Cycle Time of Milk Tanks by Work Study Technique in Small Scale Fabrication Industry.” Work study techniques are expensive to implement in small-scale industries. However, this method gives better results than any other technique. These techniques not only help reduce the cycle time, but also have proved useful in numerous other departments in the industry such as inventory control, productivity, quality, labor work, and at various machines in a machine shop to develop process variation.

Rishabh Mishra explored “Productivity Improvement in Automobile Industry by Using Method Study.” He established improvements on the basis of the methodical study, work procedure, and proper utilization of machine and material. This study advanced the prevailing process by reducing transportation and worker’s fatigue.

Dr. M. P. Singh worked on “Improvement in Process Industries by Using Work Study Methods: A Case Study.” His study was concerned with the battery manufacturing plant. He observed that the battery plant was not using optimum layout, which had the potential for improvement. Various layout and method study tools were applied and flow process charts, flow diagrams, and existing layouts were prepared. Novel technologies were applied to lessen the production cost, process time, cost, and energy consumption.

Prathamesh P. Kulkarni researched on “Productivity Improvement through Lean Deployment and Work Study Methods.” He concluded that critical lean tools when effectively combined with Work Study Methods could form a unique leaner system, which will provide a universal solution for any type of industry having any sort of problem regarding productivity.

Ravikumar Kamble investigated “Productivity Improvement at Assembly Station Using Work Study Techniques.” The unwanted motion involved in the operation of the assembly has been substantially reduced by designing assembly table, fastener tray, and design of proper workplace layout.

### **Work Study**

Work study employs both method study and works measurement to comprehend the overall human work potential in terms of time spent on completing a task. These procedures help to identify ways to make the task simpler and easy, which consequently increase productivity and efficiency. Work study is field helps to improve job performance, optimum usage of plant and machinery, standardization of work methods, etc. Therefore, the following are the objectives of work study:

- Scientific and controlled analysis of available methods for executing a task.
- Measuring performance of the qualified workers, both mentally and physically, which help in establishing standards for performance measurement.
- Optimum utilization of workers, plant, machinery, and other resources at minimum cost.
- Improved productivity and enhanced worker mood.
- Increasing adeptness of the organization.

For an organization, productivity can be increased over a period of time if workers are efficient and are focused. Therefore, the following are the advantages of work study:

- Increase in production efficiency.
- Higher levels of production and optimum utilization of resources.
- The Efficient flow of material and products.
- Efficient handling of material and better layout.
- Decreased cost of production, because time spent on the job is decreased.
- Increased morale of workers with an increase in safety and efficiency.
- Benchmark and standard performance levels are established, thus providing targets for the organization.
- Better job satisfaction and incentive planning due to work study.

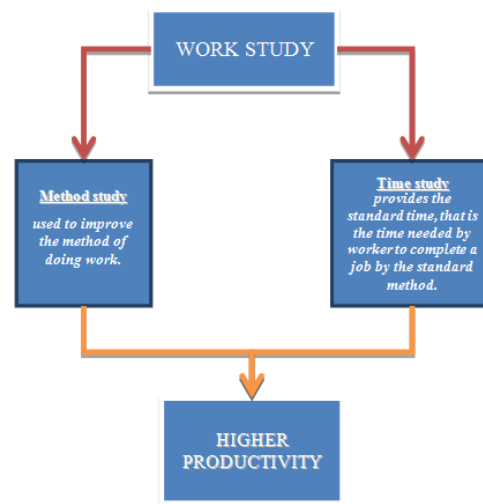
### **Method Study**

It is a scientific process for enhancing the job design. It analyzes the existing procedures and proposed job processes for improved efficiency. In addition, the method helps to identify appropriate areas that need improvement for efficient and cost-effective operations. Therefore, the following are the objectives of the methodical study:

- To study existing work process and propose improved methodologies.
- To identify new methods for increased production and reduction of cost.
- To achieve optimum utilization of resources.

Method study guarantees an increase in overall productivity and profitability to the organization. Method study involves following procedures:

- Selection of work to be studied.
- Regarding the present method.
- Critical examination of the facts.
- Development of the most practical, economic, and effective method.
- Installation of a new method.
- Maintenance of new method and checking of its practices.



**Figure: Work Study**

Study procedure. Seven fundamental steps as follows are involved:

- Select the work to be studied.
- Record all the relevant facts regarding the present method.
- Examine the facts critically and arrange in sequence using procedures best suited for the purpose.
- Develop the most practical, economic, and effective Method, having due regard to all contingent circumstances.
- Define the new method so that it can always be identified.
- Install the method as standard practice.
- Maintain regular routine checks.

### Problem Statement

- One robotic welding machine was in use for two working tables, but remained idle during the loading process. This causes an upsurge in cycle time and reduces productivity.
- The design for jig was poor.
- The Worker had unwanted fatigue because of loading or placing nails in the hole of the strip and adjusting nails in the right position. This also affected productivity.

### Objectives

- With reduced machine idle time.
- To increase productivity.
- To reduce worker' fatigue.
- To redesign jig.
- To establish the standard performance methods and standard cycle time involved.

- To optimally use equipment and manpower.
- To eliminate wasteful efforts, as well as useless handling material

## **Methodology**

The fundamental steps of this procedure are as follows:-

- **Select:** Observe and identify which process or job or workstation has ineffective time management. Or else, identify the workstation machine with significant idle time.

- **Information collection and recording:-**

- Observation
- Discussion

Recording Techniques

- Process Charts multiple activity charts or flow chart
- Diagrams: Flow diagram
- Stopwatch
- Video Recorder
- **Examine:** Questioning technique is employed. Determine the true reasons underlying each event, and make a systematic list of all avenues of possible improvement.
- **Develop:** Development involves the analysis of the following three phases.
  - Evaluation.
  - Investigations.
  - Selections.
- **Measure:** The amount of work involved and standard time required to do that particular work are estimated.
- **Define:** New techniques and standard time for procedures are defined.
- **Install:** The suggested new methods and standard time are put into operation.
- **Maintain:** The implementation of these processes must be verified at regular intervals.

Examine the newly implemented method and collect information regarding the same

## **CONCLUSIONS**

The employment of new tools and techniques associated with work study and method study will reduce the machine idle time, increase the productivity and reduce workers fatigue. The design of new jig and fixture will reduce the losses and bending of nails which will improve the quality and reduce the production cycle time. The study examined the problems associated with production from the point of a work study.

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